

## CLAIMS

What is claimed is:

1. A parametric recursive digital filter having a cut-off/center frequency, said digital filter  
5 comprising:

a delay unit having a delay element and an interconnected phase network that includes an  
controllable phase angle, where the cut-off/center frequency of said digital filter is set as a  
function of said controllable phase angle;

- a positive feedback network connected to said delay unit creating a positive feedback  
10 path; and

a feedback network connected to said delay unit creating a feedback path connected to the  
output of the delay element in the delay unit.

2. The filter according to claim 1, in which a plurality of delay units are provided.

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3. The filter according to claim 2, in which the delay units are identically designed and are  
controlled in the same manner.

4. The filter according to claim 1, wherein the delay unit comprises a delay element.

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5. The filter according to claim 1, wherein the positive feedback network comprises a  
plurality of positive feedback paths.

6. The filter according to claim 1, wherein the feedback network comprises a plurality of feedback paths.

7. The filter according to claim 1, wherein said delay unit comprises an all-pass filter.

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8. The filter according to claim 7, wherein said all-pass filter comprises:

a first adder, one input of which forms the input of the delay unit,

a second adder, the output of which forms the output of the delay unit,

a coefficient section which is connected between the output of the first adder and a first

10 input of the second adder,

a first delay element which is connected between the input of the delay unit and a second input of the second adder,

a second delay element which is connected between the output of the delay unit and a second input of the first adder,

15 the phase angle of the filter element being adjustable by changing the coefficient of the coefficient section, and

the output of the first and/or second delay element being provided for connecting a feedback path.

20 9. The filter according to claim 9, in which two delay units comprising delay elements are interconnected with one another in such a manner that only a total of three delay elements are provided, one delay element being attributable to both delay units.

10. The filter according to claim 6, in which a frequency-influencing filter unit is provided as delay unit.

11. A digital filter that receives an input signal, comprising:

5 a delay network that receives said input signal and provides a delay network output signal, and comprises a time delay element configured and arranged as an all-pass-filter having a programmable coefficient value  $\gamma$ ;

a multiplication network that receives and multiplies said input signal and said delay network output signal by uniquely associated coefficient values to provide a weighted input  
10 signal and a weighted delay network output signal; and

a summing network that receives and sums said weighted input signal and said weighted delay network output signal to provide a filter output signal.